[16 cont.]

[31] the one hand, to the Okovanggo and the regions inhabited by the Bamangwato [Ngwato] west of Ngami Lake on the other hand, are inhabited by the tribes of the !Kung group.

Seiner (2) supplies the following apt division of this zone:

[113] 2. Mitteilungen aus Deutschen Schutzgebieten, 1914.

"The !Kung Veld forms the part of the Omaheke belonging to the northern Kalahari and is located between the Okovanggo (from Kagere to 19° southern latitude), the Kaukau Veld, the Sand Veld, the Karst Veld, the Etosha Pan, and the Otjimpolo Veld. -- The Kaukau Veld (according to Passarge, a plateau) is located between the Kung Veld, the Okovanggo, the Okovanggo basin, and the Sand Veld district. As the western boundary, in other words, toward the Sand Veld, the line Bogara -- Debra -- Blue Bush Pan in the western tip of the Okovanggo basin, close to the German border, should be adopted. The northern Sand Veld, through which I have traveled, can be delimited on the west by the line Nuragas -- Otjituo and by the valley of the Omatako from Otjituo to Okahitua; on the south by the line Okahitua -- Okosondusu -- Otjosonjou -- Epata -- Epukiro -- Rietfontein-East; on the east by the border zone of the Chanse Veld, the Okovanggo basin, and the Kaukau Veld. For the
137 northern boundary toward the Kung Veld, the factors of climate and plant geography must be taken into consideration, since there is no natural boundary here; the line Bogara -- Kanovlei -- Nuragas approximately forms the northern boundary of the Kalahari bush of the central Kalahari, which is sharply differentiated from the dry forest of the northern Kalahari. -- The loose,
[134] deep, leached steppe sand bears for the most part a tall, light xerophytic dry forest, usually with no underbrush and with deciduous trees that, as a result of the quantities of water stored in their root stalks and trunks, bear green leaves during the greater part of the dry season, and in part even bear blossoms and fruit during this season; this dry forest is a formation of
[134] relatively recent date. The vegetation of the firm, gray-humus, loamy river sand, or of the looser sand with ample ground

[16 cont.]

[134] 137 saturation and ground water, is a dry forest of a different type which corresponds to Warburg's lowland forest and, in contrast to the light dry forest of the looser sand, is distinguished by a relatively high density. -- The dry forest steppe occupies the largest areas of the !Kung Veld, and [17] lowland forest and grass steppe form only modest enclaves in it. Within the dry forest, at those places where the nature of the terrain makes possible the accumulation and preservation of relatively significant quantities of water or ground humidity, there are individual trees that are to be regarded as remnants of a former compact lowland forest, and the floristic composition of such forest islands leads to the conclusion that the entire region, with the exception of the primary grass steppes, whose floor probably never displayed taller vegetation because of its sterility, was once covered by a lush lowland forest as is preserved in its finest form at present in the northern Kalahari and in the 'rain forest' of Victoria Falls."

101 [131] By the !Kung Bushmen in the narrower sense, who are divided into a northern group and an eastern group, I refer to those people who are located north of the police zone and south of the Okovanggo in the effluent region of the Omuramba u Owambo at the Löwenomuramba and on both sides of the lower and central Omuramba u Omatako. The groups in the source region of the Omuramba u Owambo have been studied by me in 174 greater detail. In former times, the !Kung undoubtedly lived much farther south and west. It is not improbable that they left the Grootfontein plain and the Otawi mountains under the pressure of the Hei//om, who in turn were forced out of the central region by the Herero. On the other side they undoubtedly gained space toward the south, for according to reports from the pre-war period, the Nogau were settled in the Sand Veld all the way to the vicinity of Otjituo, whereas today they have retreated 144 behind Alexeck. The racial composition of the !Kung Bushmen allows one to make a conclusion about their history. Among them we find a larger number of Europoid types than among the surrounding Bantu tribes. In addition, Austroloid influence is

[17 cont.]

144 obvious, and the southern Bushman race, that is, the one that displays the characteristics generally ascribed to the Bushmen as a whole, is found to be pure only to a modest degree which in-
137 creases toward the south. In the north, the !Kung Bushmen are
184 decidedly forest people, whereas in the Sand Veld they inhabit
● 134 the shadeless low bush. The surface of the region consists of
137 areas of whitish sand, red toward the east and north, which is streaked with strips of surface chalk. Along the Omuramba Omatako and parallel to it there are pseudo-dunes running north-northeast -- south-southwest and covered with dense thorn bushes. On the more clayey soils in the vicinity of the Omurambas [perhaps a local term for "rivers"] there is denser tropical dry forest. A reminder of more humid times is provided by three or four giant baobab trees that are dying.

Ludwig Zukowsky (1) reports on the fauna and flora:

[113]

> 1. "Beitrag zur Kenntnis der Säugetiere Deutschsüdwestafrikas [Contribution to the Knowledge of the Mammals of German Southwest Africa], " Archiv für Naturgeschichte, Vol. 90, No. 1, Part A, 1924.

137
[136] "The Kung Veldt, a large deciduous broad-leaf forest region, bounded in the north by the Okovanggo, in the east by this river's flood area, in the south by the Dusche and Schadum, and in the west by the lower course of the Omuramba u'Omatako, is regarded by J.H. Wilhelm as a special faunal region, since here the most striking representatives of the Sand Veld, oryx, oribi, bubalis, guevei [blue duiker], and canis are absent and in their place new forms appear, such as damaliscus, schaeffia [?], and hippotragus. Red sand dominates the entire region, which is covered with sereng [Burkea africana], red bean trees [Copaifera coleosperma], mokussi (Baikiaca plurijuga), yellowwood [Terminalia sericea], dolf [Therocarpus erinaceus], and wild orange trees (Strychnos schumanniana). During the rainy season, when the trees are covered with leaves, the deciduous forest that covers the entire region remotely resembles a younger German beech forest. The chief tree is the sereng (Burkea africana) with its accompanying tree, the mokussi

[18 cont.]

134 The ground is covered with red sand (fox sand), which in the thorn bush areas changes to a firm, grayish-yellow; perhaps argillaceous sand. Chalk cliffs and other rocks are completely lacking. The Kaudum bed is perpetually covered with dense green grass. The sand pans have humous sand; only in the northeast near Schamatura is a peat-like swampy soil to be found with red, strongly ferruginous water. Forest fires are the order of the day, but they do little damage to the tree growth."

133 134 South of the Omuramba u Owambo there is a fairly large number of limestone pans, which in part still contain water but are mostly dried up. The land there is drying up rapidly, according to both the Bushmen and the Europeans. During the rainy season the clayey soils are swampy, and at that time the [136] [164] dense bush forest is filled with myriads of mosquitoes, and malaria claims its victims from all races. The unhealthy situa- 648 tion, the difficulty of getting workers, and the irregularity of the rainfall have led to the abandonment of most of the farms outside Grootfontein, so that the Bushmen have actually gained ground there. The !Kung Bushmen outside the police zone live entirely according to their old customs and traditions. The in- [578] [619] dividual kin groups are in part hostile to one another. A kind of hereditary feud exists with the Hei//om, who are often attacked because of the women. The !Kung live on good terms with the farms along the northern boundary (Duwib, Keitsas, Keibeb, Kuntsas, Neitsas, Foxhof). Many of them work there for [464] certain periods of time, and quite a few permanently; in particular, they like to let women and children work on the farms. [177] [439] Mr. Cleark, the owner of Keibeb, has trained a large number of them to make charcoal. These Bushmen make the charcoal out in the wilderness and deliver it. It is then resold to the mottramite mine in Abenab. Until the establishment of the police zone, a perpetual state of war existed between the police and the Bushmen. There are constant battles between the Herero of Otjituo and the !Kung because of livestock thefts. The Herero attack the Bushmen on horseback and kill them from the saddle with the kirri.

The Bushmen, who are not accustomed to shooting at rapidly moving targets, usually come out the losers. Like the

7:Story N-5 (1955) 1958 FX10 Bushmen FX10

INTRODUCTION.

Early in 1955 the Chief of the Union Government Division of Botany received a request through the British Museum for a botanist to accompany the Harvard-Smithsonian-Peabody expedition, which in the winter of that year was to make a study of the Bushmen of the Bechuanaland Protectorate and South West Africa. The duties of the botanist would be to investigate and report upon the plants used by the Bushmen in obtaining food and drink, and this task was assigned to me in my capacity as one of the Botanical Survey Officers of the Division of Botany. 121

I joined the expedition on 10th June at Molepolole, after it had been some weeks in the field, and we thereafter travelled along the route shown on the map, reaching Windhoek on 2nd September. 122

There were two main areas of study, one in the country south of Ghanzi and the other north of Ghanzi. The southern area, part of the Kalahari Desert, was remarkably uniform in every way. The surface was deep loose sand, gently undulating and with occasional shallow depressions of firm dark soil known as pans, which collect a little water after rain. We did not see a hill after leaving Molepolole until the Ghanzi area was reached, nor a stone, except for shelves of limestone in some of the pans. There was no permanent water in the 300 miles between Kudumalapshwe and the Ghanzi farms, but Khungwane waterhole and Khomodimo Pan had not yet dried up. Khungwane held one or two thousand gallons and Khomodimo contained a pond about thirty yards across and a foot or so deep. It provided a home, rather unexpectedly, for a coot (*Fulica cristata*) and a water-scorpion (one of the *Nepidae*). There are no records of the central Kalahari rainfall, but it would be between 18·5 and 19·6 inches, which are the mean annual figures for Ghanzi and Molepolole respectively. In spite of this low rainfall, and although we were there in the dry season, we found that the sand a few inches below the surface and down to at least three feet was damp enough to retain its form when squeezed in the hand. One specimen of a species of Breviceps was found in the sand, a small burrowing frog which does not swim or jump and which passes through its tadpole stage in a mass of frothy material which surrounds the eggs. The commonest animals were the rodents whose burrows and tracks were in thousands along our route. The game included gemsbok, springbok, hartebees, eland, blue wildebees, giraffe and smaller antelopes and hares. Of the carnivora, lions, leopards, wild dogs, jackals and hyaenas were present. Ostriches and bustards were seen and occasional small birds of various species, but birds were on the whole poorly represented. The vegetation was mainly grassland, usually about four feet tall and mixed with many shrubs a little taller. Trees were seldom absent for more than a few miles at a stretch, and were scattered to form a parkland or in belts thick enough to hamper the progress of our lorries through them. 133 [134] [312] [136] [132] 136 137X

The northern area was much more varied, with the undulations sometimes forming distinct rises and dales. Hills, however, were still absent, although there were occasional outcrops of limestone and other rock. The soils were for the most part fairly firm, but sandy nevertheless, and damp below the surface. From time to time we crossed zones of purer loose sand, slightly raised above the surrounding country and known as dunes. A number of permanent waterholes, groups of large pans and a rainfall estimated to be about 20 inches a year (Department of Transport 1953) made this area better watered than the Kalahari, and better wooded. 133 [134] [132] 137X

15: Marshall E-5 (1951-1961) 1965
FX10 Bushmen FX10
!Kung

guages, some now virtually extinct, were characterized by a fifth click made with the lips, called the kiss click (⊙). In addition to clicks, the Bushman languages have tones: high, middle, low, rising, and falling. Oswin Köhler has given special attention to tone as well as to other features in his study of Bushman languages, especially Barakwenga (Köhler 1962).

Each of the large divisions of the Bushman languages—the northern, central, and southern divisions (see Bleek 1956)—differs markedly from the others. Within each group are several languages, sometimes resembling each other enough to be considered merely dialects of the same language, but more often differing so widely as to be distinct, mutually quite unintelligible languages. The !Kung described in this chapter (Köhler's and Westphal's !Xũ) belong to the northern group.

HABITAT • The Kalahari Desert, some 1200 miles long, with a mean high altitude of about 3000 feet, forms part of the great plateau of southern Africa. It is a basin in form, covered with wind-blown sands, sometimes red, sometimes white, to a depth of 300 to 400 feet. The underlying rock crops out rarely in ridges and a few low hills.

Stamp (1953:78) classifies the Kalahari as a semidesert. Its conditions are not the most extreme. Our expeditions recorded daytime air temperatures in the shade up to 115° F. and sand temperatures in the sun up to 140° F. In winter the temperature at night falls below freezing but for most of the year the nights are temperate. Although they seem acclimated to the heat, the Bushmen appear to find the colder temperatures very uncomfortable and shiver violently if they are away from their fires when the cold south winds blow.[5]

The rainfall, which comes in summer thunderstorms—6 to 10 inches, increasing in the better-watered parts toward the north, according to Wellington (1955:61)—though slight, is sufficient to sustain a varied drought-resistant vegetation, and the country is covered with grass, brush, and scant small trees. In the northern and northwestern parts, the trees are more numerous and taller and include shivi groves and nut-bearing mangetti—important sources of food to the Bushmen. And in all the areas of the desert that Bushmen inhabit are found edible plants, in scant, far-apart patches perhaps, but existing. The vegetation, furthermore, provides material for fires, shelter, weapons, implements, tanning, poison for arrows, and juices (for example tsama melons, on which these people can live when there is no water). In short, this desert provides the things that make life possible; otherwise the Bushmen would be dead or somewhere else.

The desert is a forceful shaper of the outlines of Bushman culture, and both the possibilities it permits and the limitations it imposes have been meaningfully summarized by Robert Story in a personal communication:

15: Marshall E-5 (1951-1961) 1965
FX10 Bushmen FX10
!Kung

A lack of permanent water is probably the most trying of the difficulties which beset the Bushmen of the present day in the country which shelters them. However, it is this very disadvantage which has ensured their survival, for while they have been dispossessed of their country and exterminated in the less arid parts, in the "Great Thirst Land of the Kalahari" they have been comparatively safe from their European and Bantu enemies. The austerity and hardships of the Kalahari are offset to some extent by its deep level mantle of sand, which prevents run-off of the rainwater and makes it readily available for plant growth. "Clay, for example, is as dry as dust to the plant when it contains 18% of water, while most sands are very nearly saturated with 18% of water" (Schantz 1911). This means not only that the sandy soil can support more luxuriant plants in greater variety, but also that storage organs are common among them, for drainage in sand is so rapid and thorough that shallow-rooted plants at least are in a stronger position if they are able to collect and store the water before it sinks into the deeper layers.

Although some of the storage organs are poisonous, the Bushmen still have numerous edible bulbs, tubers and roots at their disposal. Thanks again to the sand, they can harvest these quickly and easily with wooden digging-sticks which would be inadequate in a heavy or stony soil. Other storage organs which they do not eat because of bitterness or high tannin or fibre content are nevertheless important indirectly through being eaten by the various antelopes that are the Bushmen's meat supply.

Hunting is easier as well, for as there could be few better tracking surfaces than the Kalahari sand and, as a wounded animal can thus be followed with very little risk of loss, hard-hitting weapons and careful aim are not necessary. Instead, the Bushmen use small poisoned arrows which have the advantage of being effective on any part of the body and of bringing death as certainly to big game as to small.

LINGUISTIC AND BAND GROUPINGS • The major groupings among the Bushmen cannot correctly be called tribes; they are, rather, linguistic groupings and the names by which they have been traditionally known by Europeans refer to language: for example, !Kung-speaking Bushmen, Naron-speaking Bushmen. The Bushmen themselves and their Bantu neighbors use a multitude of names by which they refer to various combinations of local groupings. Our own tentative and incomplete comparisons lead us to say that the language groups differ from one another markedly in some customs while they are much the same in others.

The language groups have no political unity among or within themselves. The only social unit larger than the family is the autonomous band composed of several families and headed by a headman (see "Political Organization," p. 267). Each of the major groupings has many bands within it.

The Bushmen whose social structure I describe in this chapter are a group of !Kung-speakers who call themselves *ju /õassi* and who live in the Nyae Nyae region of South West Africa. It is a region of about 10,000

133 three rock outcrops and one ring of large pans. These features are illustrated in Map 12, p. 71.[1]

Soils and vegetation

134 The dune crests and flanks are characterized by deep
137 loose sand of red and white. These support a distinctive association of broad-leaved trees and shrubs. The molapos, both in the interstices of the dunes and in the more deeply incised river beds, are characterized by compacted grey soils. These molapos support an association of complex-leaved thorn trees and shrubs.

134 The color and composition of the soil appear to be a function of elevation. The color sequence from reddish to grey correlates with the texture sequence from loose to firm. These two sequences correlate with elevation within local drainage systems.

Thus the reddest, loosest sands are found on the crest of the dunes. The flanks of the dunes and the flats have buff white compacted soils, and the molapos have grey, highly compacted soils.

These sequences are schematized in Figure 1, p. 72.

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[1] As of April, 1965, there are no maps available for this area. Map 12 is based on the examination of aerial photographs on file at Maun, B.P. and the author's rough transects by Land Rover.

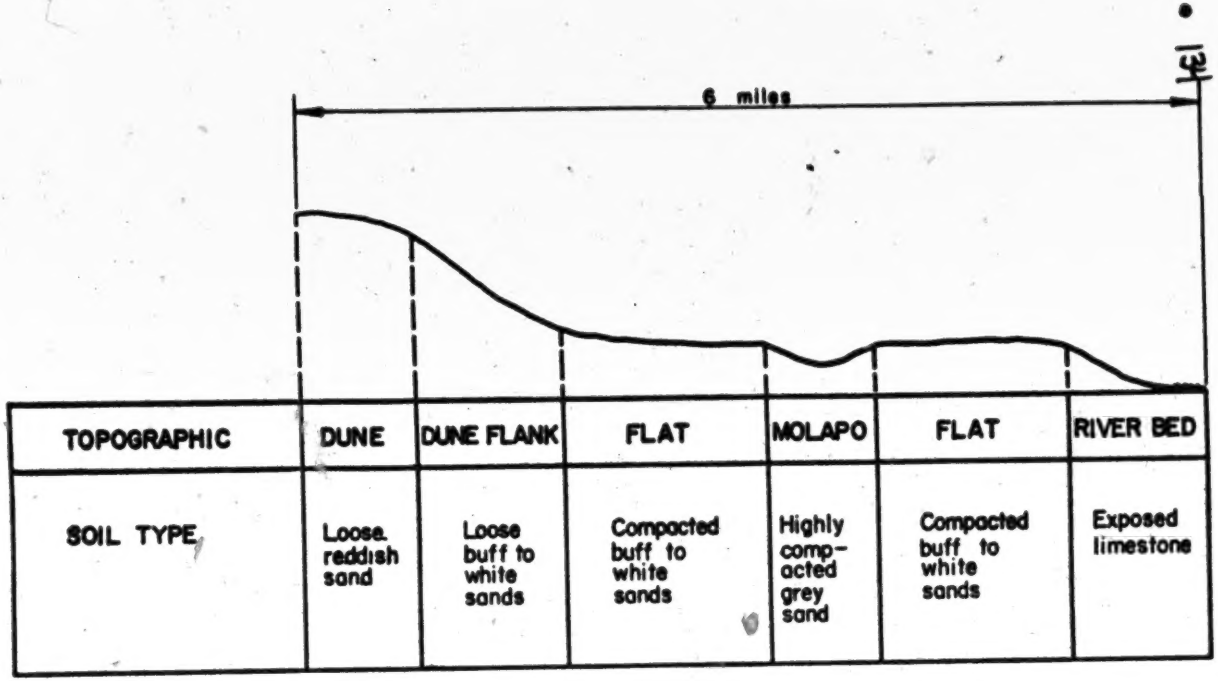

FIGURE I A schematized north-south cross-section through the Dobe Area, illustrating the correlation of soil color and texture with elevation (vertical scale exaggerated).

II. The Molapo Association

134
137 a) The bottoms of the dry river beds support a rather different association from the interstices between the dunes. The river valleys expose the underlying limestone formation. This rocky surface supports trees of the following species:

Commiphora africana

C. pyracanthoides

Combretum imberbe

Hyphaene ventricosa

Adansonia digitata

b) The interstices between dunes where the soils are compacted grey and limestone is only sporadically exposed, support the following:

Acacia mellifera subspecies detinens

A. heteracantha

Dichrostachys glomerata

D. cinerea

Croton gratissimus

Boscia albitrunca

Grewia flava

c) In some molapos the compacted soils are lighter grey verging on buff. Here are found dense thickets of Terminalia prunioides interspersed with stands of Sclerocarya caffra.

137 Certain species are characteristic of all three subdivisions of the molapo association, but are nowhere dominant.

312 for a few weeks after heavy rains, to great ponds up to 400 feet long which may hold water several months after the rains have ceased.

• 134 137 III. The 'Flats' Association: Intermediate in elevation between the dunes and the molapos are plains of buff to white compacted sands. These plains or flats support a vegetation which has affinities to both the dune and molapo associations. It also contains species that are not found elsewhere.

The flats may be divided into two intergrading types on the basis of soil differences:

a) looser buff sands supporting species that extend into the dune association and also several other diagnostic species.

b) compacted white sands supporting species that extend into the molapo association as well as several other diagnostic species.

III. a) Flats of loose sand have the following diagnostic species:

Lonchocarpus nelsii

Acacia giraffae

A. gilletiae

A. fleckii

as well as:

134
137

Terminalia sericea

Sclerocarya caffra

III. b) Flats of compacted sand have the following diagnostic species:

Acacia stolonifera var. A. hebeclada

A. dulcis

Ziziphus mucronata

as well as:

Hyphaene ventricosa

Terminalia prunioides

Combretum imberbe

Grewia flava

The most reliable marker species for distinguishing vegetation zones are:

1. Ricinodendron -- found only on dune crests

2. Commiphora africana -- found only on limestone

3. Terminalia sericea - T. prunioides -- These two species of Terminalia are sharply segregated ecologically. T. sericea is ubiquitous on looser buff to white sands but never on compacted sand. T. prunioides is found only on compacted buff to grey sands, never in loose sand.

133 The Dobe area vegetation and water: The foregoing remarks apply broadly to the 25,000 sq. miles delineated above. The Dobe area in the center of this tract contains all the major physiographic features (dunes, molapos, rock outcrop, pans) and will therefore illustrate the local patterning of

2: Schapera E-4, 5 (no date) 1930
FX13 Hottentot FX13
Bushman FX 10

of the Orange River is very dry. The level arid plain of Bushmanland further east is essentially a continuation of the Kalahari, from which it is separated by the deep rocky valley of the Orange River. The summer rainfall is low (5 to 10 inches), increasing gradually from the west eastwards; there is practically no surface water, and the soil is usually bare, stony or sandy. The river-beds are mostly dry throughout the greater part of the year, and the Orange River is the only one that always contains water. The general aspect of the vegetation both here and in Namaqualand is that of widely-separated xerophytic shrubs and bushes, with a fair proportion of succulent plants in the low-lying valleys and on the rocky outcrops. Grasses do not form a conspicuous feature, but they occur on the high plateaus and sandy plains, where the vegetative period is short, and where they always assume a tufted habit.

Further south and east is the Upper or Northern Karroo, an arid tract of country stretching northwards to the Orange River at an elevation of between 2,800 and 6,000 feet above sea-level. It is bounded on the west by the Roggeveld, on the south by the Nieuweveld and Sneeuwberg ranges, which form part of the great escarpment of the interior plateau. The landscape appears for the most part in the form of vast treeless plains, only here and there broken by table-topped hills boldly scarped by sandstone and dolerite sheets, while occasionally dark ridges, the outcrops of inclined sheets of dolerite, are seen traversing the country for many miles.

The region is exposed to great extremes of temperature. Severe frosts are experienced in the winter nights, while the summer heats are correspondingly severe, reaching at times to 110° F. in the shade. The feeling of oppression at such times is increased by the hot westerly winds which predominate during the first half of summer, although the nights are cool even during the periods of greatest heat. The winter days, on the other hand, are very enjoyable, the air being keen and bright with a maximum of sunshine. There is a wide range of rainfall, from less than 5 inches in the north-west to 25 inches in the east; the greater part of this falls in violent summer thunderstorms, and almost all the water runs off the sun-baked soil into deep gullies which hurry it off to the sea. Severe droughts are common, and the streams are all intermittent. The soil is shallow and rock-strewn, except in the alluvial tracts in the valley bottoms, and surface limestone becomes an important feature in the drier parts of the region. Pans are abundant, and a striking feature in the low-grade

2: Schapera E-4, 5 (no date) 1930
FX13 Hottentot FX13
Bushmen FX10.

valleys of the north-west are the wide "vloers" of Carnarvon and Calvinia, more or less well-defined flat areas a few miles wide and thinly covered with brackish silt.

Owing to the great range in rainfall and altitude there is a considerable diversity of conditions in this region. While the north-western parts are little better than desert, the more favoured districts to the south and east are well covered with permanently-occupied farms, although agriculture is restricted to the alluvial tracts. The vegetation is everywhere of a semi-desert character. The greater part of the country supports only a sparse and incomplete covering of shrublets and stunted, skeleton-like bushes, most of which belong to the family *Compositae*. In spite of their unpromising appearance when burnt up by the rays of the summer sun, they afford excellent sustenance for stock even in the driest seasons, and at the present time they provide nourishment to millions of sheep and goats, supporting one of the great wool growing industries of the world. Thorny plants, succulents, bulbous and tuberous plants abound in places, but trees, principally Acacias, appear as a rule only along the dry sandy river-beds. Grasses are frequent in the rainy season, but nowhere form the dominant feature of the vegetation.

The High Veld of the Orange Free State and the Southern Transvaal is essentially an extension eastwards of the Upper Karroo, but has a much better rainfall. Lying for the most part over 5,000 feet above sea-level, and with an invigorating climate, it is perhaps the most favourable region in the Union for a white population. The rainfall ranges from about 20 to 35 inches, and occurs principally during the summer months in thunderstorms. The winters are dry and cold, and severe frosts are by no means uncommon. The streams are often perennial. The country generally presents a most monotonous type of scenery, consisting of vast rolling plains, although as one travels westward towards drier regions the surface becomes flatter or more varied by steep-sided flat-topped hills. It is essentially grass country and for the most part devoid of indigenous trees, except along the river-banks, which are frequently clothed with willows and mimosas; shrubs are found on the koppies, while growing among the grasses are large numbers of bulbous and tuberous plants.

The Coastal Regions

The country between the escarpment and the ocean is considerably smaller than the interior plateau, but as regards climate and structure

2: Schapera E-4, 5 (no date) 1930
FX13 Hottentot FX13
Bushmen FX10

of temperature is somewhat greater. Most of the rains fall during the winter (April to September), when the temperature, though mild, is still relatively low. The summer is the dry season, and long droughts regularly recur.

These climatic conditions have resulted in the production of a peculiar and characteristic type of vegetation. The dominant plants are evergreen shrubs some three to six feet high, usually with small, stiff, leathery leaves. Between the shrubs are many smaller plants, numbers of which possess bulbs, tubers or other subterranean organs storing up quantities of water and food substances. The sandy plains support a dwarf, heath-like vegetation, while the marshy hollows, the stream margins, mountain ravines and mountain summits all possess their own peculiar plant forms. The families characteristic of this region include the *Proteaceae*, to which belong many of the evergreen shrubs, among them the well-known silver tree (*Leucadendron argenteum*) of the Cape Peninsula and the sugar bush (*Protea mellifera*); the *Restionaceae*, a family of grass-like plants which largely take the place of true grasses in this region, though many of the latter occur as well; and the *Ericaceae* (heath family), which are very numerous and often strikingly beautiful. Forest patches are found in the kloofs and seaward sides of the mountains, the largest area of more or less continuous forest in the Union lying between the Outeniqua Mountains and the sea, extending from George through Knysna to the Humansdorp district. They are composed almost entirely of high timber trees, the more common being species of yellow wood, cedar, ebony, stinkwood, ironwood, and sneezewood.

The last natural region with which we are concerned is the Central or Great Karroo of the Cape Province. Lying at a level of from 1,500 to 3,000 feet above the sea, it stretches as a gently-undulating plain from the foot-hills of the Folded Belt to the mountains forming part of the great escarpment in the north. On the west it extends to the valley of the Olifants River, while in the east the Sundays River may be taken as marking its limit. The mountains of the Folded Belt rob the rain-bearing winds from the sea of their moisture, and so give rise to the aridity of this region. The rainfall is scanty, the annual mean being less than 5 inches in the west, although it increases to 15 inches in the centre and east. The surface soil is shallow, hard, and compact; the river-courses are dry, except during the brief periods of rainfall in the summer, when the bulk of the water is rushed off immediately to the sea. In the dry season the whole region presents